

## **2.2.6 Air Quality**

### **2.2.6.1 Regulatory Setting**

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act (CCAA) is its companion state law. These laws, and related regulations by the EPA and the California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM)—which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM<sub>10</sub>) and particles of 2.5 micrometers and smaller (PM<sub>2.5</sub>)—and sulfur dioxide (SO<sub>2</sub>). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility-reducing particles, sulfates, hydrogen sulfide (H<sub>2</sub>S), and vinyl chloride. The NAAQS and State standards are set at levels that protect public health with a margin of safety and are subject to periodic review and revision. Both State and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under NEPA. In addition to this environmental analysis, a parallel “Conformity” requirement under the FCAA also applies.

#### ***Conformity***

The conformity requirement is based on FCAA Section 176(c), which prohibits the USDOT and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plans (SIP) for attaining the NAAQS. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. EPA regulations at 40 CFR 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for State standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO<sub>2</sub>, O<sub>3</sub>, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and in some areas (although not in California), SO<sub>2</sub>. California has nonattainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO<sub>2</sub>, and also has a nonattainment area for Pb; however, Pb is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of RTPs and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the MPO, FHWA, and FTA make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and scope that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and EPA-approved emissions models; and in particulate matter areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in CO and particulate matter nonattainment or maintenance areas to examine localized air quality impacts.

### **2.2.6.2 Affected Environment**

This section has been prepared based on the analysis and findings presented in the following technical studies which assess project impacts on regional and local air quality:

- *Air Quality Study Report* (April 2017)
- *Air Quality Conformity Analysis* (February 2018)

#### ***Environmental Setting***

The proposed project is located within the South Coast Air Basin (Basin), which is a 6,600-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San

Bernardino, and San Jacinto mountains to the north and east. Air quality regulation in the Basin is administered by the South Coast Air Quality Management District (SCAQMD). The Basin includes Orange County and the non-desert parts of Los Angeles, Riverside, and San Bernardino counties, in addition to the San Geronio Pass area of Riverside County. Its terrain and geographical location determine the distinctive climate of the Basin, as it is a coastal plain with connecting broad valleys and low hills.

The Basin is characterized as having a Mediterranean climate (i.e., a semiarid environment with mild winters, warm summers, and moderate rainfall). The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild and tempered by cool sea breezes. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (i.e., weather and topography), as well as manmade influences (i.e., development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

Average temperatures in the coastal area vary from lows in the mid-50s to highs in the mid-70s °F, with annual precipitation ranging from 8 to 12 inches. Total precipitation in the project area averages approximately 9 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer. Wind monitoring stations are located in the cities of Costa Mesa and Mission Viejo near the project corridor. Wind blows predominantly from the west in Costa Mesa and predominantly from the south in Mission Viejo. The entirety of the corridor alignment is situated between these two cities. The average wind speed as recorded by the aforementioned wind monitoring stations is approximately  $3.4 \pm 0.5$  mph, with calm winds occurring approximately 0.2 to 0.8 percent of the time.

### ***Existing Air Quality***

EPA has established NAAQS for six criteria pollutants that have been linked to potential health concerns. These federal criteria pollutants include CO, NO<sub>2</sub>, O<sub>3</sub>, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), Pb, and SO<sub>2</sub>. In addition to the NAAQS, the State of California has established ambient air quality standards for VRP, sulfates, H<sub>2</sub>S, and vinyl chloride. Table 2.2.6-1 shows the National and State Ambient Air Quality Standards in addition to the principal health effects, atmospheric effects, and typical sources of each pollutant. Refer to the *Air Quality Study Report* (2017) for a detailed description of air pollutants, along with sources and health effects.

**Table 2.2.6-1. State and Federal Criteria Air Pollutant Standards, Effects, and Sources**

| Pollutant  | Averaging Time       | State Standard <sup>a</sup> | Federal Standard <sup>b</sup>  | Principal Health and Atmospheric Effects   | Typical Sources   | State Attainment Status | Federal Attainment Status        |
|--|----------------------|-----------------------------|--|--|---|-------------------------|----------------------------------|
| Ozone (O <sub>3</sub> )  | 1 hour               | 0.09 ppm <sup>c</sup>       | — <sup>d</sup>   | High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic volatile organic compounds (VOCs) may also contribute. | Low-altitude O <sub>3</sub> is almost entirely formed from reactive organic gases (ROG)/VOCs and nitrogen oxides (NO <sub>x</sub> ) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes. | Nonattainment           | Nonattainment (Moderate)         |
|  | 8 hours              | 0.070 ppm                   | 0.070 ppm (4 <sup>th</sup> highest in 3 years)                                 |  |   |                         |                                  |
| Carbon Monoxide (CO)   | 1 hour               | 20 ppm                      | 35 ppm   | CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical O <sub>3</sub> . Colorless, odorless.  | Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.   | Attainment              | Attainment-Maintenance           |
|  | 8 hours              | 9.0 ppm <sup>a</sup>        | 9 ppm  |  |   |                         |                                  |
|  | 8 hours (Lake Tahoe) | 6 ppm                       | —  |  |   |                         |                                  |
| Respirable Particulate Matter (PM <sub>10</sub> ) <sup>e</sup> | 24 hours             | 50 µg/m <sup>3f</sup>       | 150 µg/m <sup>3</sup> (expected number of days above standard < or equal to 1) | Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic and other aerosol and solid compounds are part of PM <sub>10</sub> .                                 | Dust- and fume-producing industrial and agricultural operations; combustion smoke and vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.   | Nonattainment           | Attainment-Maintenance (Serious) |
|  | Annual               | 20 µg/m <sup>3</sup>        | — <sup>e</sup>   |  |   |                         |                                  |

**Table 2.2.6-1. State and Federal Criteria Air Pollutant Standards, Effects, and Sources**

| <b>Pollutant</b>  | <b>Averaging Time</b>  | <b>State Standard<sup>a</sup></b> | <b>Federal Standard<sup>b</sup></b>                               | <b>Principal Health and Atmospheric Effects</b>   | <b>Typical Sources</b>   | <b>State Attainment Status</b> | <b>Federal Attainment Status</b> |
|---|--|-----------------------------------|---|---|--|--------------------------------|----------------------------------|
| Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>e</sup> | 24 hours   | —                                 | 35 µg/m <sup>3</sup>  | Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter (DPM) – a toxic air contaminant – is in the PM <sub>2.5</sub> size range. Many toxic and other aerosol and solid compounds are part of PM <sub>2.5</sub> . | Combustion, including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NO <sub>x</sub> , sulfur oxides (SO <sub>x</sub> ), ammonia, and ROG. | Nonattainment                  | Nonattainment (Moderate)         |
|   | Annual   | 12 µg/m <sup>3</sup>              | 12.0 µg/m <sup>3</sup>  |   |  |                                |                                  |
|   | 24 hours (conformity process <sup>g</sup> )                            | —                                 | 65 µg/m <sup>3</sup>  |   |  |                                |                                  |
|   | Secondary Standard (annual; also for conformity process <sup>e</sup> ) | —                                 | 15 µg/m <sup>3</sup> (98 <sup>th</sup> percentile over 3 years)   |   |  |                                |                                  |
| Nitrogen Dioxide (NO <sub>2</sub> )                       | 1 hour   | 0.18 ppm                          | 0.100 ppm <sup>h</sup>  | Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain and nitrate contamination of stormwater. Part of the “NO <sub>x</sub> ” group of O <sub>3</sub> precursors.   | Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.   | Attainment                     | Attainment-Maintenance           |
|   | Annual   | 0.030 ppm                         | 0.053 ppm   |   |  |                                |                                  |
| Sulfur Dioxide (SO <sub>2</sub> )                         | 1 hour   | 0.25 ppm                          | 0.075 ppm <sup>i</sup> (99 <sup>th</sup> percentile over 3 years) | Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.   | Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.   | Attainment                     | Attainment                       |
|   | 3 hours  | —                                 | 0.5 ppm <sup>j</sup>  |   |  |                                |                                  |
|   | 24 hours   | 0.04 ppm                          | 0.14 ppm (for certain areas)                                      |   |  |                                |                                  |
|   | Annual   | —                                 | 0.030 ppm (for certain areas)                                     |   |  |                                |                                  |

**Table 2.2.6-1. State and Federal Criteria Air Pollutant Standards, Effects, and Sources**

| Pollutant                           | Averaging Time          | State Standard <sup>a</sup>   | Federal Standard <sup>b</sup>             | Principal Health and Atmospheric Effects  | Typical Sources   | State Attainment Status | Federal Attainment Status |
|-------------------------------------|-------------------------|---|---|---|---|-------------------------|---------------------------|
| Lead (Pb) <sup>k</sup>              | Monthly                 | 1.5 µg/m <sup>3</sup>   | —   | Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.  | Pb-based industrial processes like battery production and smelters. Pb paint, leaded gasoline. ADL from older gasoline use may exist in soils along major roads.                            | Attainment              | Unclassified/Attainment   |
|                                     | Calendar Quarter        | —   | 1.5 µg/m <sup>3</sup> (for certain areas) |   |   |                         |                           |
|                                     | Rolling 3-month average | —   | 0.15 µg/m <sup>3l</sup>                   |   |   |                         |                           |
| Sulfate                             | 24 hours                | 25 µg/m <sup>3</sup>  | —   | Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.   | Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.  | Attainment              | N/A                       |
| Hydrogen Sulfide (H <sub>2</sub> S) | 1 hour                  | 0.03 ppm  | —   | Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor.  | Industrial processes such as refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs. | Attainment              | N/A                       |
| Visibility-Reducing Particles (VRP) | 8 hours                 | Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70% | —   | Reduces visibility. Produces haze. NOTE: Not directly related to the Regional Haze program under the federal CAA, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas; however, some issues and measurement methods are similar. | See particulate matter above. May be related more to aerosols than to solid particles.  | Attainment              | N/A                       |

**Table 2.2.6-1. State and Federal Criteria Air Pollutant Standards, Effects, and Sources**

| Pollutant                   | Averaging Time | State Standard <sup>a</sup> | Federal Standard <sup>b</sup> | Principal Health and Atmospheric Effects  | Typical Sources       | State Attainment Status | Federal Attainment Status |
|-----------------------------|----------------|-----------------------------|-------------------------------|---|-----------------------|-------------------------|---------------------------|
| Vinyl Chloride <sup>k</sup> | 24 hours       | 0.01 ppm                    | —                             | Neurological effects, liver damage, cancer.<br>Also considered a toxic air contaminant. | Industrial processes. |                         | N/A                       |

<sup>a</sup> State standards are “not to exceed” or “not to be equaled or exceeded” unless stated otherwise.

<sup>b</sup> Federal standards are “not to exceed more than once a year” or as described above.

<sup>c</sup> ppm = parts per million

<sup>d</sup> Prior to June 2005, the 1-hour O<sub>3</sub> NAAQS was 0.12 ppm. Emission budgets for 1-hour O<sub>3</sub> are still in use in some areas where 8-hour O<sub>3</sub> emission budgets have not been developed, such as the San Francisco Bay Area.

<sup>e</sup> Annual PM<sub>10</sub> NAAQS revoked October 2006; was 50 µg/m<sup>3</sup>. 24-hour PM<sub>2.5</sub> NAAQS tightened October 2006; was 65 µg/m<sup>3</sup>. Annual PM<sub>2.5</sub> NAAQS tightened from 15 µg/m<sup>3</sup> to 12 µg/m<sup>3</sup> December 2015 and secondary annual standard set at 15 µg/m<sup>3</sup>.

<sup>f</sup> µg/m<sup>3</sup> = micrograms per cubic meter

<sup>g</sup> The 65 µg/m<sup>3</sup> PM<sub>2.5</sub> (24-hour) NAAQS was not revoked when the 35 µg/m<sup>3</sup> NAAQS was promulgated in 2006. The 15 µg/m<sup>3</sup> annual PM<sub>2.5</sub> standard was not revoked when the 12 µg/m<sup>3</sup> standards was promulgated in 2015. The 0.08 ppm 1997 O<sub>3</sub> standard is revoked for conformity purposes only when area designations for the 2008 0.75 ppm standard become effective for conformity use (7/20/2013). Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for newer NAAQS are found adequate, SIP amendments for the newer NAAQS are approved with an emission budget, EPA specifically revokes conformity requirements for an older standard, or the area becomes attainment/unclassified. SIP-approved emission budgets remain in force indefinitely unless explicitly replaced or eliminated by a subsequent approved SIP amendment. During the “Interim” period prior to availability of emission budgets, conformity tests may include some combination of build versus no build, build versus baseline, or compliance with prior emission budgets for the same pollutant.

<sup>h</sup> Final 1-hour NO<sub>2</sub> NAAQS published in the *Federal Register* on 2/9/2010, effective 3/9/2010. Initial area designation for California (2015) was attainment/unclassifiable throughout. Project-level hot-spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause redesignation to nonattainment in some areas after 2016.

<sup>i</sup> EPA finalized a 1-hour SO<sub>2</sub> standard of 75 ppb (parts per billion [thousand million]) in June 2010. Nonattainment areas have not yet been designated as of September 2015.

<sup>j</sup> Secondary standard, set to protect public welfare rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.

<sup>k</sup> ARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. DPM is part of PM<sub>10</sub> and, in larger proportion, PM<sub>2.5</sub>. ARB and EPA have identified Pb and various organic compounds that are precursors to O<sub>3</sub> and PM<sub>2.5</sub> as toxic air contaminants. There are no exposure criteria for adverse health effects due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.

<sup>l</sup> Lead NAAQS are not considered in Transportation Conformity analysis.

Source: *Air Pollution Standards, Standard Environmental Reference, Department of Transportation, website:*  
[http://www.dot.ca.gov/ser/downloads/AirQualityConformity/eq\\_updates\\_air\\_pollution\\_stds\\_tbl.docx](http://www.dot.ca.gov/ser/downloads/AirQualityConformity/eq_updates_air_pollution_stds_tbl.docx), accessed June 2, 2015.

ARB and SCAQMD maintain a network of air quality monitoring stations located throughout the Basin to characterize the air quality environment by measuring and recording pollutant concentrations in the local ambient air. The project corridor extends along 8.5 miles of I-405 in Orange County, transecting the city of Irvine and southern portions of unincorporated Orange County. The air monitoring stations nearest to the proposed project corridor are the Costa Mesa Monitoring Station in the city of Costa Mesa (approximately 3.5 miles west of the project corridor) and the Mission Viejo Monitoring Station in the city of Mission Viejo (approximately 3.5 miles southeast of the project corridor). The Costa Mesa Monitoring Station records concentrations of hourly O<sub>3</sub>, 8-hour O<sub>3</sub>, and NO<sub>2</sub>. The Mission Viejo Monitoring Station records concentrations of hourly O<sub>3</sub>, 8-hour O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>. SCAQMD has ceased active monitoring of CO and SO<sub>2</sub> within the Basin after more than a decade of measured concentrations demonstrating atmospheric levels substantially below the applicable standards. To supplement the ARB data, monitoring data for CO and SO<sub>2</sub> in Orange County were obtained through the EPA Air Data web interface. The EPA Orange County Monitoring Station is located at the same address as the SCAQMD Costa Mesa Monitoring Station. A map of monitoring stations can be found in the *Air Quality Study Report*.

Table 2.2.6-2 displays measured pollutant concentrations, the State and federal standards, and the annual frequency of exceeded ambient air quality standards recorded at the monitoring stations nearest to the alignment. Criteria pollutants NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, CO, and SO<sub>2</sub> did not exceed the State or federal standards from 2011 to 2015 at any monitoring station; however, during the same time period, O<sub>3</sub> concentrations exceeding the 1-hour State standard were recorded between zero and four times annually by the Costa Mesa and Mission Viejo monitoring stations. Additionally, O<sub>3</sub> concentrations exceeding the State and federal 8-hour standards were recorded between one and 10 times annually by the Costa Mesa and Mission Viejo monitoring stations during the past 5 years.

### ***Attainment Status***

The attainment status in the project area is shown as part of Table 2.2.6-1. According to the NAAQS, the Orange County component of the Basin is designated by EPA as a moderate nonattainment area for O<sub>3</sub> and PM<sub>2.5</sub>, unclassified/attainment for Pb, and a maintenance area for PM<sub>10</sub>, CO, and NO<sub>2</sub>. ARB designated the project area as nonattainment for O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>, as unclassified for H<sub>2</sub>S and VRP, and as attainment for CO, NO<sub>2</sub>, SO<sub>2</sub>, Pb, and sulfate. The conformity process does not address pollutants for which the area is attainment/unclassified, mobile source air toxics (MSATs), other toxic air contaminants or hazardous air pollutants, or greenhouse gases (GHGs).

**Table 2.2.6-2. Ambient Air Quality Data**

| Pollutant  | Criteria  | Annual Maximum Concentrations and Frequencies of Exceeded Standards |                 |                 |                 |                 |
|--|---|---|-----------------|-----------------|-----------------|-----------------|
|  |   | 2011  | 2015            | 2013            | 2014            | 2015            |
| Costa Mesa Air Monitoring Station <sup>a</sup>                     |   |   |                 |                 |                 |                 |
| O <sub>3</sub>   | Maximum 1-hour Concentration (ppm)<br>Days > 0.09 ppm (State 1-hour standard)   | 0.093<br>0  | 0.090<br>0      | 0.095<br>1      | 0.096<br>1      | 0.099<br>1      |
|  | Maximum State 8-hour Concentration (ppm)<br>Days > 0.070 ppm (State 8-hour standard)  | 0.077<br>2  | 0.076<br>1      | 0.084<br>2      | 0.080<br>6      | 0.080<br>2      |
|  | Maximum Federal 8-hour Concentration (ppm)<br>Days > 0.075 ppm (Federal 8-hour standard)  | 0.077<br>1  | 0.076<br>1      | 0.083<br>1      | 0.079<br>4      | 0.079<br>1      |
| NO <sub>2</sub>  | Maximum 1-hr Concentration (ppm)<br>Days > 0.18 ppm (State 1-hour standard)<br>Days > 0.100 ppm (Federal 1-hour standard)   | 0.061<br>0<br>0   | 0.074<br>0<br>0 | 0.076<br>0<br>0 | 0.061<br>0<br>0 | 0.052<br>0<br>0 |
| Mission Viejo Air Monitoring Station <sup>a</sup>                  |   |   |                 |                 |                 |                 |
| O <sub>3</sub>   | Maximum 1-hour Concentration (ppm)<br>Days > 0.09 ppm (State 1-hour standard)   | 0.094<br>0  | 0.096<br>2      | 0.104<br>2      | 0.115<br>4      | 0.099<br>2      |
|  | Maximum State 8-hour Concentration (ppm)<br>Days > 0.070 ppm (State 8-hour standard)  | 0.083<br>5  | 0.079<br>6      | 0.082<br>5      | 0.088<br>10     | 0.088<br>8      |
|  | Maximum Federal 8-hour Concentration (ppm)<br>Days > 0.075 ppm (Federal 8-hour standard)  | 0.083<br>2  | 0.078<br>1      | 0.082<br>2      | 0.088<br>5      | 0.088<br>3      |
| PM <sub>10</sub>   | Maximum 24-hour concentration (µg/m <sup>3</sup> )<br>Days > 50 µg/m <sup>3</sup> (State 24-hour standard)<br>Days > 150 µg/m <sup>3</sup> (Federal 24-hour standard) | 48.0<br>0<br>0  | 37.0<br>0<br>0  | 50.0<br>0<br>0  | 41.0<br>0<br>0  | 49.0<br>0<br>0  |
| PM <sub>2.5</sub>  | Maximum 24-hour concentration (µg/m <sup>3</sup> )<br>Days > 35 µg/m <sup>3</sup> (Federal 24-hour standard)  | 33.4<br>0   | 27.6<br>0       | 28.0<br>0       | 25.5<br>0       | 31.5<br>0       |
|  | Annual Arithmetic Mean (µg/m <sup>3</sup> )   | 8.5   | 7.9             | 8.0             | *               | 7.0             |
|  | Exceed State Standard (12 µg/m <sup>3</sup> )   | No  | No              | No              | No              | No              |
|  | Exceed Federal Standard (12.0 µg/m <sup>3</sup> )   | No  | No              | No              | No              | No              |
| Los Angeles-Long Beach-Anaheim Air Monitoring Station <sup>b</sup> |   |   |                 |                 |                 |                 |
| CO   | Maximum 8-hour concentration (ppm)<br>Days > 9.0 ppm (Federal 8-hour standard)  | 2.2<br>0  | 1.7<br>0        | 2.0<br>0        | 1.9<br>0        | 2.2<br>0        |
| SO <sub>2</sub>  | Maximum 1-hour Concentration (ppm)<br>Days > 0.25 ppm (State 1-hour standard)<br>Days > 0.75 ppm (Federal 1-hour standard)  | 7.7<br>0<br>0   | 6.2<br>0<br>0   | 4.1<br>0<br>0   | 8.8<br>0<br>0   | 4.5<br>0<br>0   |
| Notes: "*" = insufficient data.                                    |   |   |                 |                 |                 |                 |

Sources:

<sup>a</sup> Air Quality Data Statistics, <http://www.arb.ca.gov/adam/topfour/topfour1.php>, accessed September 20, 2016.

<sup>b</sup> U.S. EPA Air Data. <https://www.epa.gov/outdoor-air-quality-dat>.

### ***Sensitive Receptors***

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. ARB identifies sensitive individuals as segments of the population most susceptible to poor air quality (i.e., children, the elderly, and those with pre-existing serious health problems affected by air quality). Land uses where sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities. According to SCAQMD, sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Figure 2.2.6-1 shows sensitive receptors within 1,000 feet of the freeway ROW. Along the new alignment, surrounding land use varies widely. The corridor includes areas of substantial residential, retail, and other commercial and industrial land uses.

### **2.2.6.3 Environmental Consequences**

#### ***Transportation Conformity***

The conformity requirement is based on federal CAA Section 176(c), which prohibits USDOT and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to the SIP for attaining the NAAQS. Transportation conformity applies to highway and transit projects and takes place on two levels: the regional—or, planning and programming level—and the project level. The proposed project must conform at both levels to be approved. In response to a complete request for a project-level conformity determination submitted by Caltrans, FHWA found that the project conforms with the SIP in accordance with 40 CFR Part 93.

#### ***Regional Conformity***

Alternative 2 is listed in the 2016-2040 financially constrained RTP/SCS, which was found to conform by SCAG on April 7, 2016, and FHWA and FTA made a regional conformity determination finding on June 2, 2016. Alternative 2 is also included in SCAG's financially constrained 2017 FTIP, listed on page 4 of the Orange County State Highways. The SCAG 2017 FTIP was determined to conform by FHWA and FTA on December 16, 2016. The design concept and scope of Alternative 2 is consistent with the project description in the 2016-2040 RTP/SCS, 2017 FTIP, and the “open to traffic” assumptions of the SCAG's regional emissions analysis.



Figure 2.2.6-1. Sensitive Receptor Location (Sheet 1 of 2)



Figure 2.2.6-1. Sensitive Receptor Location (Sheet 2 of 2)

### ***Project-Level Conformity***

#### **Carbon Monoxide Hot-Spots**

Caltrans has developed a CO Protocol for assessing CO impacts of transportation projects. The procedures and guidelines comply with the following regulations without imposing additional requirements: Section 176(c) of the 1990 federal CAA Amendments, federal conformity rules, State and local adoptions of the federal conformity rules, and the CEQA requirements [California Code of Regulations Title 21 Section 1509.3(25)]. In their Project-Level Conformity Determination letter, dated June 7, 2018, FHWA found that the project “conforms with the State Implementation Plan (SIP) in accordance with 40 CFR Part 93.” The signed conformity determination letter is included in Appendix I.

Two conformity-requirement decision flow charts are provided in the CO Protocol for intersection analyses. An explanatory discussion of the steps used to determine the conformity requirements that apply to the current project is provided below:

- Is the project exempt from all emissions analyses? NO. The proposed project is a highway improvement project, which would not be exempt from regional emissions analysis per 40 CFR 93.126.
- Is the project exempt from regional emissions analysis? NO. The proposed project is a highway improvement project, which would not be exempt from regional emissions analysis per 40 CFR 93.127.
- Is the project locally defined as regionally significant? YES. The proposed project would add mixed-flow lanes to the I-405 corridor. The proposed project is defined as regionally significant.
- Is the project in a federal attainment area? NO. The proposed project is located within an attainment/maintenance area for the federal CO standard as of June 11, 2007.
- Is there a currently conforming RTP and FTIP? YES. The 2016-2040 RTP/SCS was found to conform by SCAG on April 7, 2016, and FHWA and FTA made a regional conformity determination finding on June 2, 2016. The 2017 FTIP was determined to conform on December 16, 2016.
- Is the project included in the regional emissions analysis supporting the currently conforming RTP and FTIP? YES. The design concept and scope of Alternative 2 is consistent with the project description in the 2016-2040 RTP/SCS, 2017 FTIP, and the open to traffic assumptions of the SCAG regional emissions analysis.

- Has project design concept and/or scope changed significantly from that in regional analysis? NO. See previous response.
- Examine local impacts. Section 3.1.9 of the flowchart directs the project evaluation to Section 4 (Local Analysis) of the CO Protocol.

Assessment of the project's effect on localized ambient air quality is based on analysis of CO. As stated in the CO Protocol, the determination of project-level CO impacts should be carried out according to the local analysis. The following discussion provides explanatory remarks for every step of the local analysis of the CO Protocol (screening methodology):

- Is the project in a carbon monoxide nonattainment area? NO. The project site is located in a federal attainment/maintenance area as of June 11, 2007.
- Was the area redesignated as "attainment" after the 1990 CAA? YES. See previous response.
- Has "continued attainment" been verified with the local Air District, if appropriate? YES. As shown in Table 2.2.6-2, above, monitored CO concentrations in the project area were below the NAAQS for the latest 3-year period.
- Does the project worsen air quality? YES. The proposed project would increase regional CO emissions compared to no-build emissions.
- Is the project suspected of resulting in higher CO concentrations than those existing within the region at the time of the attainment demonstration? NO. To answer this question, Section 7.4.2 of the CO Protocol recommends selecting one of the worst-case locations in the region where attainment has been demonstrated and comparing it to the build scenario of the project with a similar configuration. Therefore, the intersection of Wilshire Boulevard and Veteran Avenue from the SCAQMD 2003 Air Quality Management Plan (AQMP) Appendix V attainment demonstration and the intersection of Jamboree Road and Main Street for the build alternatives were compared to evaluate whether the project would result in higher CO concentrations using the following conditions.
  - a) The receptors at the intersection of Jamboree Road and Main Street would be the same distance or farther from the traveled roadway than the receptors at the intersection of Wilshire Boulevard and Veteran Avenue for which attainment has been demonstrated. The attainment demonstration evaluated the CO concentrations at 10 feet from the edge of the roadways. Because the CO Protocol does not permit the modeling of receptor locations closer than 10 feet, receptor locations for the build alternatives would be the same or farther than the receptors evaluated for the attainment demonstration.

- b) The Jamboree Road and Main Street intersection would have lower traffic volumes compared to the intersection of Wilshire Boulevard and Veteran Avenue. The traffic volumes are presented in Table 2.2.6-3.

**Table 2.2.6-3. CO Hot-Spot Analysis Study Intersections  
Peak-Hour Traffic Volumes**

| Intersection  | Peak-Hour Traffic Lane Volumes |           |            |            | Total Volume |
|---|--------------------------------|-----------|------------|------------|--------------|
|   | West Link                      | East Link | North Link | South Link |              |
| Attainment Demonstration: Wilshire Boulevard and Veteran Avenue | 4,951                          | 3,317     | 1,400      | 933        | 10,601       |
| No Build Alternative (2050): Jamboree Road and Main Street      | 2,750                          | 1,550     | 2,280      | 3,450      | 10,030       |
| Alternative 2 (2050): Jamboree Road and Main Street             | 2,750                          | 1,550     | 2,300      | 3,540      | 10,140       |
| Alternative 3 (2050): Jamboree Road and Main Street             | 2,760                          | 1,530     | 2,270      | 3,540      | 10,100       |

*Source: Terry Hayes and Associates, Air Quality Study Report, 2017.*

- c) The worst-case meteorology used for the Jamboree Road and Main Street intersection would be identical to the meteorology used for the Wilshire Boulevard and Veteran Avenue intersection in the attainment demonstration. The CAL3QHC model was used for the attainment demonstration; therefore, if the proposed project were modeled, both intersections would be evaluated using the same meteorology settings in the CAL3QHC model, as the model only has one meteorological data set.
- d) The peak-hour traffic volumes presented in Table 2.2.6-3 show that the peak-hour link volumes for Jamboree Road and Main Street would be lower than the traffic volumes at the intersection of Wilshire Boulevard and Veteran Avenue used in the attainment demonstration.
- e) The number of vehicles operating in cold start mode was not available in the attainment demonstration for the Wilshire Boulevard and Veteran Avenue intersection; however, the percentage of vehicles operating during the peak hour in cold start mode for the Jamboree Road and Main Street intersection would be expected to be the same or lower than the Wilshire Boulevard and Veteran Avenue intersection.
- f) The percentage of heavy-duty gas trucks utilizing the Jamboree Road and Main Street intersection would be expected to be the same or less than the Wilshire Boulevard and Veteran Avenue intersection. It is assumed that the traffic distribution at the Wilshire Boulevard and Veteran Avenue intersection would not vary from the EMFAC2002

default distribution used for the attainment demonstration. The percentage of trucks would be expected to range from 3 to 4 percent under the build alternatives, which would include gasoline and diesel trucks; therefore, the percentage of heavy-duty gas trucks would be expected to be less.

- g) The average delay and queue length for the Jamboree Road and Main Street intersection would be expected to be the same or less than the Wilshire Boulevard and Veteran Avenue intersection used for the attainment demonstration. The LOS for the Wilshire Boulevard and Veteran Avenue intersection used for the attainment demonstration was not listed; however, based on the traffic volumes and intersection geometry, the intersection was likely LOS F. The average delay and queue length is not available for the Jamboree Road and Main Street intersection; however, this intersection has lower volumes than the Wilshire Boulevard and Veteran Avenue intersection and could not have an LOS worse than F. Therefore, the average delay and queue length for the proposed project would be expected to be the same or less than the Wilshire Boulevard and Veteran Avenue intersection.
- h) The background concentrations of CO in the project area are lower than the CO concentrations used in the attainment demonstration for the intersection of Wilshire Boulevard and Veteran Avenue. The maximum background 8-hour CO concentration measured between 2010 and 2014 at the Costa Mesa Monitoring Station, which is in the area of the Jamboree Road and Main Street intersection, was between 1.7 and 2.2 ppm. According to SCAQMD, 1-hour CO concentrations were last reported in 2014, and the highest concentration in Costa Mesa was 3 ppm. These concentrations are lower than the background concentrations used for the attainment demonstration, which were predicted to be 10.8 ppm for the 1-hour measurements and 9.9 ppm for the 8-hour measurements for the year 2002.

The evaluation of the above conditions has shown that the Jamboree Road and Main Street intersection would not be expected to result in higher CO concentrations than the Wilshire Boulevard and Veteran Avenue intersection used for the attainment demonstrations. In addition, the SCAQMD 2003 AQMP Appendix V attainment demonstration indicated that in 1997 and 2002, 1-hour CO concentrations were considerably lower than the NAAQS and CAAQS (Table 2.2.6-4). The analysis was based on 1997 and 2002 traffic volumes and showed 38 to 45 percent reduction in concentrations between the 2 years. The assessment demonstrates that the proposed project would not create a CO hot-spot at any intersections in the vicinity of the alignment

**Table 2.2.6-4. Maximum 1-Hour Carbon Monoxide Concentrations  
at the Most Congested Intersections in Los Angeles**

| Scenario Years and Intersections   | Morning<br>(ppm) <sup>a</sup> | Afternoon<br>(ppm) <sup>b</sup> | Peak<br>(ppm) <sup>c</sup> | Standard<br>(ppm) | Maximum 1-Hour CO<br>Concentration from<br>2011–2015 at the<br>Costa Mesa<br>Monitoring Station<br>(ppm) <sup>d</sup> |
|--|-------------------------------|---------------------------------|----------------------------|-------------------|---|
| <b>1997</b>  |                               |                                 |                            |                   |   |
| Wilshire Boulevard and Veteran Avenue <sup>e</sup>   | 7.7                           | 5.7                             | -                          | 35                | 3   |
| Sunset Boulevard and Highland Avenue <sup>f</sup>  | 6.9                           | 7.3                             | -                          | 35                | 3   |
| La Cienega Boulevard and Century Boulevard <sup>g</sup>  | 6.4                           | 5.2                             | -                          | 35                | 3   |
| Long Beach Boulevard and Imperial Highway <sup>h</sup>   | 5.1                           | 5.2                             | 2.2                        | 35                | 3   |
| <b>2002</b>  |                               |                                 |                            |                   |   |
| Wilshire Boulevard and Veteran Avenue  | 4.6                           | 3.5                             | -                          | 35                | 3   |
| Sunset Boulevard and Highland Avenue   | 4.0                           | 4.5                             | -                          | 35                | 3   |
| La Cienega Boulevard and Century Boulevard   | 3.7                           | 3.1                             | -                          | 35                | 3   |
| Long Beach Boulevard and Imperial Highway  | 3.0                           | 3.1                             | 1.2                        | 35                | 3   |
| <sup>a</sup> Morning: 7:00 to 8:00 a.m. for La Cienega - Century, 8:00 to 9:00 a.m. for Wilshire - Veteran, 7:00 to 8:00 a.m. for Long Beach - Imperial, and 8:00 to 9:00 a.m. for Sunset - Highland.<br><sup>b</sup> Afternoon: 3:00 to 4:00 p.m. for Sunset - Highland, 5:00 to 6:00 p.m. for Wilshire - Veteran, 4:00 to 5:00 p.m. and Long Beach - Imperial, and 6:00 to 7:00 p.m. for La Cienega - Century.<br><sup>c</sup> Peak: 11:00 to 12:00 p.m. (concentration at the hour of the observed peak). Peak is only provided for the Long Beach/Imperial intersection because it is the intersection associated with the regional peak at Lynwood.<br><sup>d</sup> The maximum background 1-hour CO concentration is not available on the ARB database. According to SCAQMD, 1-hour CO concentrations were last monitored in 2014, and the highest concentration in Orange County was 3 ppm.<br><sup>e</sup> The most congested intersection in Los Angeles County. The average daily traffic volume is approximately 100,000 vehicles per day.<br><sup>f</sup> One of the most congested intersections in the City of Los Angeles. The intersection study has been conducted and traffic data are available.<br><sup>g</sup> One of the most congested intersections in the City of Los Angeles. The intersection study has been conducted and traffic data are available.<br><sup>h</sup> The Lynwood Air Monitoring Station consistently records the highest 8-hour CO concentrations in the Basin each year. |                               |                                 |                            |                   |   |

Source: 2003 AQMP, Appendix V, Modeling and Attainment Demonstrations, page V-4-26.

To supplement the intersection analysis and bolster the substantiation that no CO hot-spots would result from the proposed project, CO emissions along the most heavily trafficked segment of the mainline I-405 were modeled using CALINE4. While CALINE4 is typically used for modeling CO concentrations at intersections, the CO Protocol recommends that the model be used to estimate maximum impacts from transportation projects. The I-405 segment with the highest CO emission density was identified between Sand Canyon Avenue and Jeffrey Road/University Drive in year 2050. Maximum peak-hour emissions were modeled with receptors conservatively

set to within 10 feet of the Caltrans ROW. The maximum 1-hour concentration was predicted to be 0.3 ppm along the I-405 mainline, which is substantially below the NAAQS. Applying a persistence factor of 0.7 for the 8-hour concentration, as discussed in the CO Protocol, generates an 8-hour concentration of 0.2 ppm. When added to the existing background concentrations of 3.1 and 2.2 ppm for the 1- and 8-hour concentrations, respectively, the 1-hour concentration would be 3.4 ppm and the 8-hour concentration would be 2.4 ppm. These concentrations would be well below the 1- and 8- hour NAAQS of 35 and 9 ppm, respectively.

Therefore, according to the CO Protocol, the proposed project is satisfactory, and no further analysis is needed. The proposed project would not be expected to create a CO hot-spot; therefore, the proposed project has demonstrated project-level conformity for CO.

### **Particulate Matter Hot-Spots**

A PM hot-spot analysis is required under the EPA Transportation Conformity rule for Projects of Air Quality Concern (POAQC). According to the EPA Transportation Conformity Guidance, five types of projects are considered POAQC. These types of projects are listed below, along with information related to the proposed project.

1. New or expanded highway projects that have a significant number of or significant increase in diesel vehicles (significant number is defined as greater than 125,000 Average Annual Daily Traffic [AADT] and 8 percent or more of such AADT is diesel truck traffic, or in practice 10,000 truck AADT or more regardless of total AADT);

The proposed project is an expanded highway project that would not result in a significant increase in the number of diesel vehicles along the 8.5-mile-long I-405 corridor. The average increase in average daily trucks along the corridor would be 331 additional trucks in the design year of 2050; therefore, the proposed project would not result in a significant increase in the number of diesel vehicles and would not be considered a POAQC under this criterion.

2. Projects affecting intersections that are at LOS D, E, F, with a significant number of diesel vehicles, or that that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

The proposed project is along the freeway mainline and not at an intersection. Similar to the mainline analysis presented above, the proposed project would not add a significant number of diesel vehicles to an intersection; therefore, the proposed project would not be considered a POAQC under this criterion.

3. New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

The proposed project would not implement a new bus or retail terminal or transfer point; therefore, the proposed project would not be considered a POAQC under this criterion.

4. Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; or

The proposed project does not involve expansion of a bus or rail terminal or transfer point; therefore, the proposed project would not be considered a POAQC under this criterion.

5. Projects in or affecting locations, areas, or categories of sites that are identified in the PM<sub>2.5</sub> or PM<sub>10</sub> Implementation Plan or Implementation Plan submission, as appropriate, as sites of possible violation;

The proposed project is not in or affecting a site of PM<sub>10</sub> or PM<sub>2.5</sub> air quality standard violation; therefore, the proposed project would not be considered a POAQC under this criterion.

The proposed project (Project ID ORA131304) has undergone Interagency Consultation regarding POAQC determination. Interagency Consultation participants concurred that the project is not a POAQC on August 23, 2016. The proposed project is not considered a POAQC because it does not meet the definition as defined in EPA's Transportation Conformity Guidance; therefore, PM hot-spot analysis is not required. A copy of the Transportation Conformity Working Group's finding is shown in Figure 2.2.6-2.



The screenshot shows a web page titled "PM Hot Spot Analysis Project Lists" with a subtitle "Review of PM Hot Spot Interagency Review Forms". It contains a table with two columns: "August, 2016" and "Determination".

| August, 2016                          | Determination  |
|---------------------------------------|--|
| <a href="#">ORA131304 August 2016</a> | Not a POAQC – Hot Spot Analysis Not Required (EPA concurrence was received via email prior to meeting) |
| <a href="#">RIV011232 August 2016</a> | Not a POAQC – Hot Spot Analysis Not Required (EPA concurrence was received via email prior to meeting) |

<http://www.scag.ca.gov/programs/Pages/ProjectLevel.aspx>

**Figure 2.2.6-2. Transportation Conformity Working Group POAQC Finding**

### Construction Emissions Related to Project-Level Conformity

Construction would occur over approximately 4 years for Alternative 2 (Preferred Alternative), beginning in 2026 and completing in 2030. Construction would intermittently move along the length of the alignment. Construction activities would not last for more than 4 years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123(c)(5)). Public comment regarding the conformity analysis was requested as part of the Draft IS/EA circulation on November 14, 2017. No public comments related to conformity were received.

### Criteria Pollutant and Ozone Precursor Emissions

Mobile source emissions in the project corridor were estimated for exhaust, brake wear, tire wear, and re-entrained dust. Emissions were estimated using project-specific traffic data, CT-EMFAC (version 6.0), and EPA guidance for re-entrained dust. The following discussion summarizes the methodology and results. Refer to the *Air Quality Study Report* for additional methodology and detailed traffic data used in the emissions analysis.

The emissions factors generated by the CT-EMFAC modeling software are expressed in units of grams of pollutant emitted per mile traveled (g/mi) and are associated with a vehicle type traveling at a given speed. The raw traffic data files contained traffic volume data for non-trucks and trucks during four time periods of the day, as shown below:

- Morning (AM) (6:00 a.m. to 9:00 a.m.) 3 hours
- Midday (MD) (9:00 a.m. to 3:00 p.m.) 6 hours
- Afternoon (PM) (3:00 p.m. to 7:00 p.m.) 4 hours
- Nighttime (NT) (7:00 p.m. to 6:00 a.m.) 11 hours

The data for all time periods were compiled into a single large spreadsheet for efficient data management and analysis. The traffic data files divided the 8.5-mile-long project corridor into individual link segments of varying lengths for mainline lanes, HOV lanes, and on/off-ramps. The analysis included 121 individual link segments under the No Build Alternative and 124 individual link segments under the build alternatives due to proposed lane, exit ramp, and bypass reconfigurations. For each individual link segment, non-truck and truck volumes were provided in the traffic data files during each of the four time periods for Existing Conditions in 2015 and Alternatives 1, 2, and 3 in 2030 and 2050.

Table 2.2.6-5 shows emissions for the various years and scenarios. Future emissions were estimated to be less than existing emissions for all pollutants except PM<sub>10</sub> and PM<sub>2.5</sub>. Increases in particulate matter estimated emissions are attributed to the anticipated growth in VMT, as

estimated emissions are predominantly attributed to break and tire wear, as well as re-entrained dust. Emissions of the other criteria pollutants result solely from exhaust emissions of vehicular travel. Between the two build alternatives, Alternative 2 would generate daily regional emissions of lesser magnitude than Alternative 3 for all modeled pollutants.

**Table 2.2.6-5. Daily Mobile Source Emissions**

| Scenario  | VOC | NO <sub>x</sub> | CO    | PM <sub>10</sub> | PM <sub>2.5</sub> |
|---|-----|-----------------|-------|------------------|-------------------|
| <b>Existing Conditions</b>                              |     |                 |       |                  |                   |
|   | 217 | 1,412           | 5,721 | 562              | 189               |
| <b>Year 2030 Emissions and Comparisons</b>              |     |                 |       |                  |                   |
| Alternative 1 (No Build) (lb/day)                       | 89  | 313             | 2,249 | 596              | 191               |
| Alternative 2 (lb/day)                                  | 91  | 318             | 2,283 | 615              | 197               |
| Percent Change from 2030 No Build Alternative           | 1%  | 2%              | 1%    | 3%               | 3%                |
| Net Change from Alternative 1 to Alternative 2 (lb/day) | 2   | 5               | 34    | 19               | 6                 |
| Alternative 3 (lb/day)                                  | 92  | 323             | 2,302 | 625              | 200               |
| Percent Change from 2030 No Build Alternative           | 3%  | 3%              | 2%    | 5%               | 5%                |
| Net Change from Alternative 1 to Alternative 3 (lb/day) | 3   | 10              | 53    | 29               | 9                 |
| <b>Year 2050 Emissions and Comparisons</b>              |     |                 |       |                  |                   |
| Alternative 1 (No Build) (lb/day)                       | 87  | 228             | 1,853 | 629              | 200               |
| Alternative 2 (lb/day)                                  | 87  | 229             | 1,879 | 650              | 206               |
| Percent Change from 2050 No Build Alternative           | <1% | <1%             | 1%    | 3%               | 3%                |
| Net Change from Alternative 1 to Alternative 2 (lb/day) | <1  | 1               | 26    | 21               | 6                 |
| Alternative 3 (lb/day)                                  | 87  | 231             | 1,882 | 660              | 209               |
| Percent Change from 2050 No Build Alternative           | 0%  | 1%              | 2%    | 5%               | 5%                |
| Net Change from Alternative 1 to Alternative 3 (lb/day) | <1  | 3               | 28    | 31               | 9                 |
| Note: lb/day – pounds per day                           |     |                 |       |                  |                   |

Source: Terry A. Hayes Associates Inc., Air Quality Study Report, 2017.

### ***Mobile Source Air Toxics***

EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment. These are acrolein, benzene, 1,3-butadiene, DPM plus diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter. FHWA recommends a range of options deemed appropriate for addressing and documenting the MSAT issue in NEPA documents. These include:

- No analysis required for projects with no potential for meaningful MSAT effects—  
Applicable for categorically excluded projects under CFR Chapter 23, Section 771.117(c);

exempt projects under CFR Chapter 40, Section 93.126; or projects with no meaningful impacts on traffic volumes or vehicle mix.

- Qualitative analysis required for projects with low potential MSAT effects—Projects that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase emissions.
- Quantitative analysis for projects that have the potential for meaningful differences in MSAT emissions among project alternatives. To fall into this category, a project should:
  - Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of DPM in a single location, involving a significant number of diesel vehicles for new projects, or accommodating with a significant increase in the number of diesel vehicles for expansion projects; or
  - Create new capacity or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000 or greater by the design year; and also
- Proposed to be located in proximity to populated areas.

As shown in Section 2.1.6, Traffic and Transportation/Pedestrian and Bicycle Facilities, the multi-directional AADT would be above the 140,000 benchmark for a quantitative analysis. Based on FHWA guidance, the proposed project has the potential for meaningful differences in MSAT emissions; therefore, level of emissions for the highest priority MSATs for the No Build Alternative and build alternatives was evaluated (Level 3 Analysis: Projects with Higher Potential MSAT Effects).

The methodology used to estimate MSAT emissions (e.g., CT-EMFAC) is identical to that described above for criteria pollutant and O<sub>3</sub> precursor emissions. Refer to that discussion and the *Air Quality Study Report* for additional methodology and detailed traffic data used in the emissions analysis

Table 2.2.6-6 shows emissions for the various years and scenarios. Future emissions were estimated to be less than existing emissions for all pollutants. Between the two build alternatives, Alternative 2 would generate daily regional emissions of lesser magnitude than Alternative 3 for all modeled pollutants.

**Table 2.2.6-6. Daily MSAT Emissions**

| Scenario                                   | Acetaldehyde | Acrolein | Benzene | Butadiene | DPM  | Formaldehyde | Naphthalene | POM   |
|--|--------------|----------|---------|-----------|------|--------------|-------------|-------|
| <b>Year 2015 Emissions</b>                 |              |          |         |           |      |              |             |       |
| Existing Conditions                        | 4.1          | 0.4      | 7.5     | 1.6       | 14   | 11           | 0.2         | 0.3   |
| <b>Year 2030 Emissions and Comparisons</b> |              |          |         |           |      |              |             |       |
| Alternative 1 (No Build) (lb/day)          | 1.5          | 0.1      | 3.0     | 0.7       | 1.1  | 4.0          | 0.1         | 0.1   |
| Alternative 2 (lb/day)                     | 1.5          | 0.1      | 3.0     | 0.7       | 1.1  | 4.0          | 0.1         | 0.1   |
| Percent Change from Existing               | -63%         | -60%     | -59%    | -59%      | -92% | -62%         | -59%        | -62%  |
| Percent Change from Alternative 1          | 0.3%         | 1.4%     | 1.4%    | 1.5%      | 1.8% | 0.6%         | 1.6%        | 0.9%  |
| Alternative 3 (lb/day)                     | 1.5          | 0.1      | 3.1     | 0.7       | 1.2  | 4.1          | 0.1         | 0.1   |
| Percent Change from Existing               | -63%         | -59%     | -59%    | -58%      | -91% | -62%         | -58%        | -62%  |
| Percent Change from Alternative 1          | 1.6%         | 3.2%     | 3.2%    | 3.3%      | 2.8% | 2.0%         | 3.4%        | 2.6%  |
| <b>Year 2050 Emissions and Comparisons</b> |              |          |         |           |      |              |             |       |
| Alternative 1 (No Build) (lb/day)          | 1.5          | 0.1      | 2.9     | 0.6       | 0.9  | 4.0          | 0.1         | 0.1   |
| Alternative 2 (lb/day)                     | 1.5          | 0.1      | 2.9     | 0.6       | 0.9  | 4.0          | 0.1         | 0.1   |
| Percent Change from Existing               | -63%         | -61%     | -61%    | -60%      | -94% | -63%         | -59%        | -68%  |
| Percent Change from Alternative 1          | -0.7%        | 0.2%     | 0.0%    | 0.1%      | 1.4% | -0.5%        | 0.2%        | -0.2% |
| Alternative 3 (lb/day)                     | 1.5          | 0.1      | 2.9     | 0.6       | 0.9  | 4.0          | 0.1         | 0.1   |
| Percent Change from Existing               | -63%         | -61%     | -61%    | -60%      | -94% | -63%         | -59%        | -68%  |
| Percent Change from Alternative 1          | -1.0%        | 0.1%     | -0.1%   | 0.0%      | 2.0% | -0.7%        | 0.0%        | -0.5% |
| Note:<br>lb/day – pounds per day           |              |          |         |           |      |              |             |       |

Source: Terry A. Hayes Associates Inc., Air Quality Study Report, 2017.

### **Construction Emissions**

#### **Criteria Pollutant and Ozone Precursor Emissions**

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and various other construction-related activities. Exhaust emissions from construction equipment also are expected and would include CO, nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), directly emitted particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and toxic air contaminants such as DPM. O<sub>3</sub> is not directly emitted from construction activities; it is a regional pollutant that is formed from NO<sub>x</sub> and VOCs in the presence of sunlight and heat.

Construction of the proposed project is planned to commence in 2027 and is anticipated to be completed in 2030. The duration of construction for each build alternative is approximately 36 months (3 years). Construction would occur in four phases due to the scale of the proposed project and the need to minimize traffic impacts and maintain traffic during construction. These four phases include Grubbing/Land Clearing, Grading/Excavation, Drainage/Utilities, and Paving. Emissions were estimated using the Sacramento Metropolitan Air Quality Management District's Roadway Construction Emissions Model (RoadMod) Version 8.1. RoadMod is a data-entry spreadsheet that utilizes various sources to estimate construction emissions, including OFFROAD and EMFAC2014. Refer to the *Air Quality Study Report* for data and assumptions used to estimate emissions.

Table 2.2.6-7 shows the estimated daily emissions associated with each construction phase for Alternatives 2 and 3, respectively. The tables also include SCAQMD significance thresholds for informational purposes. Construction of Alternative 2 would generate daily emissions of lesser magnitude than construction of Alternative 3 for all criteria pollutants assessed. In addition, some phases of construction, particularly asphalt paving, may result in short-term odors in the immediate area of each paving site(s). Such odors would quickly disperse to below detectable levels as distance from the site(s) increases.

**Table 2.2.6-7. Maximum Daily Construction Emissions**

| Activities                                   | Pounds Per Day |                 |     |                  |                   |
|--|----------------|-----------------|-----|------------------|-------------------|
|  | VOC            | NO <sub>x</sub> | CO  | PM <sub>10</sub> | PM <sub>2.5</sub> |
| <b>Alternative 2 (Preferred Alternative)</b> |                |                 |     |                  |                   |
| Grubbing/Land Clearing                       | 5              | 54              | 48  | 462              | 97                |
| Grading/Excavation                           | 16             | 159             | 145 | 467              | 102               |
| Drainage/Utilities                           | 10             | 92              | 125 | 464              | 98                |
| Paving                                       | 4              | 43              | 73  | 2                | 2                 |
| <b>Alternative 3</b>                         |                |                 |     |                  |                   |
| Grubbing/Land Clearing                       | 5              | 54              | 48  | 463              | 98                |
| Grading/Excavation                           | 16             | 160             | 146 | 468              | 102               |
| Drainage/Utilities                           | 11             | 93              | 126 | 465              | 100               |
| Paving                                       | 5              | 44              | 73  | 2                | 2                 |

Source: Terry A. Hayes Associates Inc., *Air Quality Study Report*, 2017.

### **Naturally Occurring Asbestos and Structural Asbestos**

Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have commonly been used for unpaved gravel roads, landscaping, fill projects, and other improvement projects in some localities. Asbestos may be released into the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos-bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed. Serpentinite may contain chrysotile asbestos, especially near fault zones. Ultramafic rock, which is a rock closely related to serpentinite, may also contain asbestos minerals. Asbestos can also be associated with other rock types in California, though much less frequently than serpentinite and/or ultramafic rock. Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in the counties of the Sierra Nevada foothills, the Klamath Mountains, and Coast Ranges. As part of an ongoing study, the United States Geological Survey (USGS) identifies and maps reported occurrences of asbestos in the United States. The maps and reports provide federal, State, local government agencies, and other stakeholders with geologic information on the natural occurrence of asbestos.

According to the USGS Survey Map for Asbestos in California, there is no occurrence of asbestos reported within a 25-mile vicinity of the project area. These asbestos occurrences are described as outcrop exposures or in rock exposed by exploration and mining operations. Although it is not anticipated that construction activity would encounter Naturally Occurring Asbestos (NOA), the project dust control measures would effectively control unanticipated NOA exposure through a variety of required control measures, including watering. In addition, it is not anticipated that construction activity would encounter structural asbestos. If asbestos were to be encountered, the proposed project would be required to comply with SCAQMD Rule 1403 (Asbestos Emissions from Demolition/Renovation). Nationally, asbestos is regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAP). The proposed project would be required to comply with all NESHAP regulations.

### **Lead**

It is not anticipated that construction of the proposed project would involve disturbance of soils containing high levels of ADL, or painting or modification of structures with Pb-based coatings using sandblasting and other activities related to Pb paint removal or disturbance.

### *Climate Change*

Climate change is analyzed in Section 3.3. Neither EPA nor FHWA has issued explicit guidance or methods to conduct project-level GHG analysis. FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and executive orders on climate change, the issue is addressed in the CEQA discussion in Chapter 3. The CEQA analysis may be used to inform the NEPA determination for the project.

#### **2.2.6.4 Avoidance, Minimization, and/or Mitigation Measures**

Most of the construction impacts to air quality are short term in duration and will not result in long-term adverse conditions. Implementation of the following avoidance, minimization, and/or mitigation measures would reduce fugitive dust emissions resulting from construction activities. Standardized measures which are employed on most, if not all, Caltrans projects are indicated in bold.

- AQ-1:** The construction Contractor must comply with the Caltrans Standard Specifications in Section 14-9 (2015).
- AQ-2:** Section 14-9.02 specifically requires compliance by the Contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
- AQ-3:** Section 14-9.03 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are described in Section 18.
- AQ-4:** The construction Contractor must comply with SCAQMD Rule 403 (Fugitive Dust). Water or dust palliative will be applied to the site and equipment as often as necessary to control fugitive dust emissions. Fugitive emissions generally must meet a “no visible dust” criterion either at the point of emissions or at the ROW line depending on local regulations.
- AQ-5:** Soil binder will be spread on any unpaved roads used for construction purposes and on all project construction parking areas.
- AQ-6:** Trucks will be washed as they leave the ROW as necessary to control fugitive dust emissions.
- AQ-7:** A dust control plan will be developed documenting sprinkling, temporary paving, speed limits, and timely revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.

- AQ-8:** Equipment and materials storage sites will be located as far away from residential and park uses as practicable. Construction areas will be kept clean and orderly.
- AQ-9:** Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, will be used.
- AQ-10:** All transported loads of soils and wet materials will be covered before transport, or adequate freeboard (space from the top of the material to the top of the truck) will be provided to minimize emission of dust (particulate matter) during transportation.
- AQ-11:** Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to decrease particulate matter.
- AQ-12:** Mulch will be installed or vegetation planted as soon as practical after grading to reduce windblown particulate in the area. Be aware that certain methods of mulch placement, such as straw blowing, may themselves cause dust and visible emission issues and may need to use controls such as dampened straw. Hydroseeding may be used as an alternative to mulch.

Implementation of the following avoidance, minimization, and/or mitigation measures would reduce exhaust emissions resulting from construction activities:

- AQ-13:** Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by California Code of Regulations Title 17, Section 93114.
- AQ-14:** Environmentally Sensitive Areas or their equivalent will be established within 1,000 feet of sensitive air receptors. Within these areas, construction activities involving the extended idling of diesel equipment or vehicles will be prohibited, to the extent feasible.
- AQ-15:** To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.
- AQ-16:** Under ARB's idling emissions rule, 2008 and newer model year heavy-duty diesel engines will be equipped with a nonprogrammable engine shutdown system that automatically shuts down the engine after 5 minutes of idling, or optionally meet a stringent NO<sub>x</sub> idling emission standard. This rule applies to diesel-fueled commercial motor vehicles that operate in the State of California with gross

vehicular weight ratings of greater than 10,000 pounds that are or must be licensed for operation on highways.

AQ-17: To the extent feasible, all construction signal/message boards shall be solar powered.

AQ-18: To the extent feasible, electricity shall be obtained from power poles rather than temporary diesel or gasoline generators.